Appl. No. 10/736,280
Docket No. H1823-00004
Reply to Office Action of April 7, 2005

REMARKS/ARGUMENTS

As a result of this Amendment, claims 1-3, 5, 6, 16, 21-25, 33-34, and 36-42 are under active consideration in the subject patent application.

In the Official Action, the Examiner has:

(1) acknowledged Applicant's election of Species related to an alleged species directed to Figs. 2-8;

(2) objected to the drawings under 37 CFR §1.82(a);

(3) rejected claims 7-12 under 35 U.S.C. § 112, first paragraph;

(4) rejected claims 1-6, 21-25, 31 and 36-42 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 3,686,926, issued to Miller et al. (the "Miller reference");

(5) rejected claim 16 under 35 U.S.C. § 103(a) in view of U.S. Patent No. 3,686,926, issued to Miller et al.

(6) rejected claims 33-34 under 35 U.S.C. § 103(a) in view of the proposed combination of U.S. Patent No. 3,686,926, issued to Miller et al., an U.S. Patent No. 4,242,789, issued to Fox (the "Fox reference"); and

(7) identified prior art made of record and not relied upon but considered pertinent to Applicant's disclosure.

With regard to Item 1, no comment appears necessary.

With regard to Items 2 and 3, Applicant has cancelled claims 7-12 thus obviating the Examiner's objection to the drawings and the rejections related to

35 U.S.C. § 112, first paragraph. Reconsideration and withdrawal of these rejections are requested.

With regard to Items 4 and 5, Applicant traverses the Examiner's rejection of claims 1-6, 16, 21-25, 31 and 36-42 under 35 U.S.C. §102(b) in view of the Miller reference, and requests reconsideration and withdrawal of those rejections for the following reasons. Applicant provides an electrical contact that comprises a large elastic range as a result of being formed so as to comprise a plurality of interlaced, annealed, and unsupported wires. Advantageously, the present invention does not require there to be a support structure interwoven with the wires or an outer or inner support structure within which the wires reside in a formed electrical contact configuration. This is because the combination of interlacing and then subsequently annealing wires removes the need for any additional integral structural support. In other words, Applicant's electrical contacts can be operated for their intended purpose while simply comprising an unsupported mesh that has been manipulated to take a shape suitable for electrically interconnecting two or more adjacent structures. In this way, an open-ended substantially cylindrical electrical contact may be formed comprising a woven plurality of conductors having a longitudinal axis, where the woven conductors comprise a substantial absence of either elastic or plastic deformations such that longitudinal deflection of the electrical contact results in substantially only elastic deformation of the plurality of conductors. Miller's debris sensor simply cannot be said to provide this structure or its functionality.

Anticipation under 35 U.S.C. §102 requires that each and every element of the invention defined in the claim be met in a single prior art reference. Those elements must either be inherent or disclosed expressly, and must be arranged as described in the claim. See, Diversitech Corporation v. Century Steps, Inc., 850 F. 2d 675, 7 U.S.P.Q. 2d 1315 (Fed. Circuit 1988), Constant v. Advanced Micro-Devices, Inc., 848 F. 2d 1560, 7 U.S.P.Q. 2d 1057 (Fed. Circuit 1988), and Richardson v. Suzuki Motor Company, 868 F. 2d 1226, 9 U.S.P.Q. 2d 913 (Fed. Circuit 1989). The Miller reference fails to meet this requirement since Applicant's invention, as defined by at least claims 1-6, 21-25, 31 and 36-42, is not expressly or inherently disclosed within its four corners.

More particularly, Miller discloses and claims an electrical sensor for detecting the presence of conductive (metal) "chips" flowing in an oil system of various types of machinery (col. 1, lines 4-6) and which ". . .*can be used in any instance where it is desired to detect the presence of debris, conductive and non-conductive, in a fluid. . .*" (col.4, lines 20-23). Miller is not directed in any way to an electrical contact used in electrical interconnection devices. Thus it is highly unlikely that one of ordinary skill would look to this reference for teachings or structures that are related to electrical interconnection devices, their contacts, or the processes and methods used to form the same.

The Examiner has apparently relied upon the superficially similar woven or interlaced structure of Miller's debris sensor to support the erroneous conclusion that the structure of Applicant's electrical contact is taught by that reference. The

Examiner's conclusion cannot withstand a close reading of Miller. At col. 5, lines 29-42, Miller teaches as follows:

> ". . .In Fig. 2, a cylindrical detector 25 is shown wherein two continuous conductors are formed into spirals and woven with a plurality of non-conductors in plain weave manner. This particular detector offers structural strength and indicates the versatility of using weaving techniques . . . The conductors are designated 26 and are shown as continuous spirals inside the plurality of parallel non-conductors 27. The pair of conductors are woven with the non-conductors in plain weave as a filling pick over and under the non-conductors warp. . ."

Thus, the Miller reference clearly requires structural supports (non-conductors 27) to be interwoven with conductors 26 so as to form their cylindrical detector 25. The Examiner has suggested the disclosure at col. 7, lines 42-45, as providing anticipatory teachings relative to Applicant's claims 1-6, 21-25, 31 and 36-42. Here again, when viewed in context, Miller still requires his nonconductive warp be provided to support his conductors;

> ". . .Therefore, member 43 passes under the first non-conductor, crosses over member 42, passes under the next non-conductor, crosses over member 42, and so forth. . . .Locking and intermeshing of conductors and non-conductors is facilitated by the manner in which 43 tightly wraps over 42 and under 44 . . . it provides a tighter mesh . . . Conductor 43 is seen to be smaller than 42 and in practice, member 43 has been made of 0.008 inch annealed wire . . ." (col. 7, lines 25-43)

Applicant clearly states in his specification that ". . .*the interlaced and annealed structure has as at least one goal avoiding extrusions or the use of support structures. . .* " (see pages 9 and 10, and paragraph 0032 of Applicant's

specification) This expressed goal of Applicant's invention is clearly defined in at least independent claims 1, 16, 36, and 39-42. Miller, in contrast, requires his conductors 26,42,43 to be "tightly" wrapped, over and under, by his fiberglass non-conductors 27,44, i.e., conductors 26,42,43 are supported from "below and above" by fiberglass non-conductors 27,44, in order to provide "a tighter mesh" (col. 7, lines 25-43) and "structural strength" (col. 5, lines 29-42). At col. 6, lines 1-3, Miller further suggests the importance of the structural support provided by the non-conductors as follows: ". . . *Specifically, the modified weave provides improved interlocking of conductors and non-conductors* . . ." Thus Applicant's electrical contact comprises a plurality of interlaced, annealed, and unsupported wires, while Miller requires fiberglass non-conductors 44 to be interwoven with conductors to form a support structure for a debris sensor. Accordingly, it cannot be said that Miller's disclosure in any way anticipates Applicant's claimed electrical contact and interconnection device. Reconsideration is requested.

The Examiner has also relied upon the teachings of Miller to reject independent claims 21, 24, 31, 36, directed to methods for forming Applicant's electrical contact and the product formed by those processes. Significantly, Applicant defines one method in which an electrical contact is formed by elastically manipulating a plurality of wires so as to interlace the wires into a unitary structure. The unitary structure is rolled so as to form a tube, and then annealed. The unitary structure is then cut so as to form a first electrical contact. In another method, a plurality of conductors are interlaced so as to form a

continuous cylinder. Significantly (and unlike Miller) the interlaced conductors elastically engage one another so as to be substantially only elastically deformed. The interlaced and substantially only elastically deformed conductors are then annealed to substantially eliminate their elastic engagement. The continuous cylinder is then cut so as to form at least one open-ended cylinder.

Unlike Applicant's claimed methods, at col. 7, lines 42-45, Miller makes it abundantly clear that a wire 42 is being woven that is already annealed, i.e., is in an annealed condition before interlacing with non-conductors 44. Importantly, Miller does not teach or suggest that his weaving process should only elastically deform his conductors. Applicant on the other hand requires the interlaced conductors to elastically engage one another, i.e., be interlaced in an elastic state, so as to be substantially only elastically deformed, before being subjected to an annealing process so as to release the elastic strain.

Miller's and Applicant's processes are completely different from one another and yield completely different structures. Miller indiscriminately weaves conductors with non-conductors with absolutely no expressed interest or concern for the stress-strain characteristics of his conductors. Indeed, the Examiner's position begs the question: *Why should the Miller inventors have been concerned with the stress-strain characteristics of the conductors in their debris sensor when all of those conductors are structurally supported by non-conductors*? Applicant instead defines a process by which individual wires are woven into a structure having desired inherent macro-elastic properties, with a

subsequent annealing step to relieve elastic strains and thereby set the individual wires in their woven structural arrangement. Applicant's methods provide for significantly enlarged force deflection properties. Thus when woven according to Applicant's invention, and then annealed, Applicants interlaced and unsupported wires provide a resilient electrical contact structure having a significantly increased elastic range.

None of the methodologies taught by Applicant and defined in at least claims 21, 24, 31, 36, would have been of any interest to Miller because Miller discloses a debris sensor and not an electrical contact. Miller's debris sensor is not meant to flex longitudinally or be deformed in an electrical interconnection device, nor is there any disclosure within Miller that teaches or suggests a need for a structure having inherent macro-elastic properties that provide for significantly enlarged force deflection characteristics. Applicant respectfully submits that nothing within the four corners of Miller anticipates the methodology or structures defined by Applicant's claims 1-6, 21-25, 31 and 36-42.

Moreover, the Examiner's rejection of claim 16, as being obvious in light of Miller must fail, if for no other reason than there is simply no suggestion or motivation provided by that reference to form a debris sensor so that it is suitable for use as an electrical contact or so that it may form a portion of an electrical interconnection device.

Accordingly, Applicant respectfully submits that the disclosure of Miller neither anticipates nor renders obvious the invention defined by claims 1-6, 16,

21-25, 31 and 36-42. Reconsideration and withdrawal of the rejection of claims 1-6, 16, 21-25, 31 and 36-42 are requested.

With regard to Item 6, the Examiner states that Miller discloses the claimed invention except for the contact being photo-etched. As has been previously presented, Miller discloses a debris sensor and not an electrical contact. Miller's debris sensor is not meant to flex or be deformed in an electrical interconnection device, nor is there any disclosure within Miller that teaches or suggests a need for a structure having inherent macro-elastic properties that provide for significantly enlarged force deflection characteristics. In particular, Miller utterly fails to teach or suggest, in any way, an electrical contact comprising a photo-etched mesh including an array of intersecting annealed beams defining an array of rhomboidally shaped openings.

The Fox reference discloses a magnetic encoding device and method for making the same for use as magnetic storage mediums in identification control applications. Fox teaches magnetic encoding elements that are produced by uniformly bending wire or strip stock of a magnetic material longitudinally about a common radius to exceed the elastic limit of the material and subsequently mounting the material so that it is restrained in an unbent position on a substrate of nonmagnetic material. (see, e.g., col. 6, lines 54-68)

In order for a prima facie case of obviousness to be established, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the

reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2142 [emphasis added]. Miller's disclosure of a debris sensor simply cannot be said to provide an electrical contact comprising a photo-etched mesh including an array of intersecting annealed beams defining an array of rhomboidally shaped openings, nor does it provide any of the requisite motivation to combine references. Fox specifically teaches bending wires or strip stock beyond an elastic limit, while Applicant teaches only elastic deformations, whether of wires or photo-etched mesh. When these references are combined, as suggested by the Examiner, a debris sensor or magnetic storage device is suggested having a woven structure where wires or photo-etched beams are supported, from below and above, by fiberglass non-conductors, and where the metal is bent to exceed its elastic limit. This combined structure is simply not defined by any of Applicant's claims, let alone claim 33.

Since nothing in the prior art references would lead a person of ordinary skill in the art to design an electrical contact like that described in the present application, or defined by claims 33 and 34, it appears that hindsight knowledge of the present invention is the only motivation to combine these references. Applicant respectfully submits that the motivation to combine references cannot come from the invention itself. See, In re Oetiker, 24 U.S.P.Q. 2d 1443, 1446. It is improper to use the claims as a framework with individual parts of separate

prior art references employed to recreate a facsimile of the claimed invention. See, W.L. Gore and Associates, Inc. v. Garlock, Inc. 220 U.S.P.Q. 303, 312.

In summary, Applicant submits that the unique apparatus defined by claims 33-34 is not disclosed in the prior art references, taken as a whole, and there is no teaching or suggestion in the references to support their use in the particular claimed combinations. In the absence of such, the references are improperly combined. In any event, claims 33-34 define over any combination of Miller and Fox.

With regard to Item 7, Applicant has considered the prior art references identified by the Examiner as pertinent and determined that none of them, whether taken alone, or in any valid combination with the Miller et al., or Fox references, anticipates or renders obvious the present invention.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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If a telephone conference would be of assistance in advancing prosecution of the above-identified application, Applicant's undersigned Attorney invites the Examiner to telephone him at **717-237-5516**.

Respectfully Submitted,

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